

Code No: 181AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, January/February - 2024

ENGINEERING CHEMISTRY

(Common to EEE, CSE, IT, CSIT, CE (SE), CSE (CS), CSE(DS), CSD)

Time: 3 Hours

Max. Marks: 60

Note: This question paper contains two parts A and B.i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.

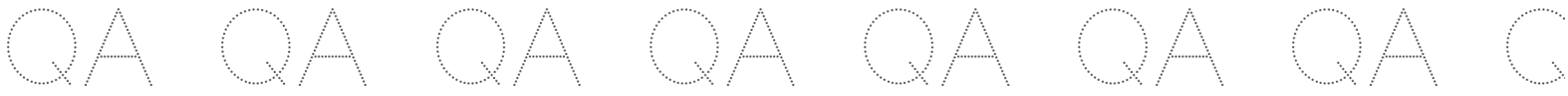
- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART- A**(10 Marks)**

- | | | |
|------|--|-----|
| 1.a) | What is temporary hardness? Give example. | [1] |
| b) | What is colloidal conditioning? | [1] |
| c) | What are secondary batteries? Give example. | [1] |
| d) | What is the cause of corrosion? | [1] |
| e) | Write the types of polymerization with examples. | [1] |
| f) | What is vulcanization? | [1] |
| g) | Write Dulong's formula. | [1] |
| h) | Write the composition of CNG. | [1] |
| i) | Define pour point. | [1] |
| j) | Write the applications of polyacryl amides. | [1] |

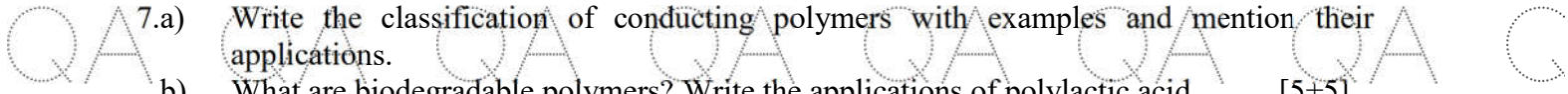
PART - B**(50 Marks)**

- | | | |
|-----------|---|-------|
| 2.a) | 100 ml of a sample of water required 25 ml of 0.01 M EDTA for the titration using Eriochrome Black-T indicator. Calculate total hardness of water. | |
| b) | Explain the desalination of water by Reverse Osmosis method. | [5+5] |
| OR | | |
| 3.a) | Explain the determination of F ⁻ ion by ion-selective electrode method. | |
| b) | Describe the steps involved in the treatment of potable water. | [5+5] |
| 4.a) | Describe the construction of Lithium-ion battery and mention the chemical reactions involved during charging and discharging. | |
| b) | Describe the construction of a methanol-oxygen fuel cell and write its applications. | [5+5] |
| OR | | |
| 5.a) | Explain the mechanism of rusting of iron in the presence of a neutral or slightly alkaline medium in the presence of oxygen with a neat diagram and chemical reactions. | |
| b) | What is the principle involved in cathodic protection? How can you protect the buried pipelines by impressed current method? | [5+5] |



- 6.a) Write the differences between thermoplastic and thermosetting plastics with examples.
b) Write the preparation, properties and applications of Teflon, Butyl rubber and Bakelite. [5+5]

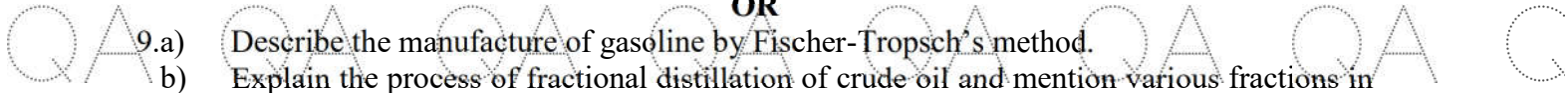
OR



- 7.a) Write the classification of conducting polymers with examples and mention their applications.
b) What are biodegradable polymers? Write the applications of polylactic acid. [5+5]

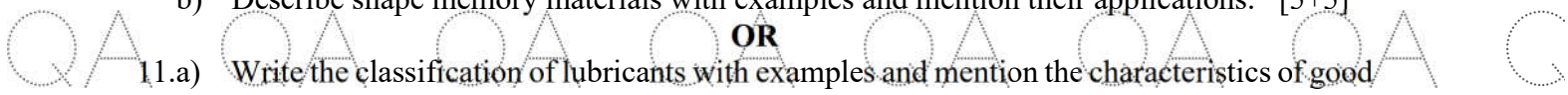
- 8.a) Explain the proximate analysis of coal and its significance.
b) Define calorific value, gross and net calorific value. What is the relation between gross and net calorific value. [5+5]

OR



- 9.a) Describe the manufacture of gasoline by Fischer-Tropsch's method.
b) Explain the process of fractional distillation of crude oil and mention various fractions in the order of their boiling ranges. [5+5]

- 10.a) Write the chemical composition of Portland cement and describe the functions of its ingredients.
b) Describe shape memory materials with examples and mention their applications. [5+5]



OR

- 11.a) Write the classification of lubricants with examples and mention the characteristics of good lubricants.
b) Describe the mechanism of thick film lubrication and mention the lubricants used in it. [5+5]

